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New Water Meter.

Liberal supplies of water in cities are blessings which cannot be too highly appreciated. To prevent waste, however, the necessity of some method of recording the quantity used in each household or establishment, is very much felt, and various methods have been adopted for effecting this result. None, however, measure with absolute mathematical perfection, some are quite expensive, and nearly all have stuffing boxes, packing, or the like, rendering them more or less liable to get out of order.

The meter represented in the accompanying engravings—an apparatus recently invented by James Cochrane, of this city—is so arranged as to require no packed parts, to work practically independent of friction, and to afford a means of measuring with great accuracy whether the flow be rapid or extremely slow. It has been constructed in various sizes, and is already in successful use in several portions of this city.

The water is received in a rocking cup, divided in two compartments. When tilted to one side, the partition induces the water to accumulate in the upper side until its gravity is sufficient to tilt the cup and discharge the quantity thus measured and weighed, and induce its accumulation on the opposite side. So far, this is an old device, but to allow the apparatus to work under a head and without diminishing the pressure of the water, the case or vessel in which the whole is enclosed, is partially filled with compressed air; and to prevent the loss of this compressed air by its escape through the pores of the metal, or its absorption by the water, provision is made for discharging, at each movement of the rocking cup, a small quantity of water from the lower part of the case, and for receiving in its place an equal volume of air from the outside, which is allowed to rise through the water, as represented.

Fig. 1 is a perspective view of the whole, the upper portion being of glass, to allow a view of the interior, while figures 2 and 3 represent sections, on a larger scale, of the device for supplying air. Fig. 4 is a vertical section of the whole, as ordinarily constructed of cast iron.

A is the pipe which supplies the water, and B a receiving and retarding vessel bolted upon the top of the main case, C. This vessel serves as a kind of air chamber, and allows the water to fall gently into the cup below. D is a cock, through which the water is discharged, and E E is the surface of the water within; it being understood that the air above E is at the density required to equal the pressure due to the head of water. This density is acquired in the first instance, simply by the rise of the surface, E E, which thus compresses it. F is the rocking cup, and F the partition therein.

COCHRANE'S WATER METER.

The cup being supported on suitable bearings, its pivot is free to roll horizontally, to a slight extent, and thus to make the resistance a rolling rather than a sliding friction. G is a lever, mounted in the same frame with F, and immediately below it. It is slightly bent, as described, and immediately below it is a cross bar, H, which regulates the extent to which either end of the lever, G, may be depressed. The center of gravity of the rocking cup, F, is at the point indicated by the star in Fig. 4, and its motion with the vibration of F, is a curve, as represented by the short dotted line. The center of gravity is thus lower at either extremity of its motion than at the middle of its vibration; and, in short, by well known laws, the cup inclines with a certain uniform degree of force, to remain at either extreme of its motion. The water received from B through the tube represented, accumulates on one side of F′ until its gravity is sufficient to overcome this tendency, when the cup rapidly tilts, and discharging its load on that side, commences to receive an equal amount on the other. There is no resistance to the commencement of this rocking motion, except the gravity of the cup, F, and the rolling friction of the support, but towards the close of its motion it strikes the elevated end of the lever, G, and depresses it. The devices for recording the strokes, and also for receiving the air, are worked from this lever, G, by the aid of the rod, I; and both these operations, though necessarily communicating with the exterior of the case, are performed without the aid of a stuffing-box of any kind.

The tight joint required at the point where the motion is carried out through the case, is obtained by the use of a kind of miniature

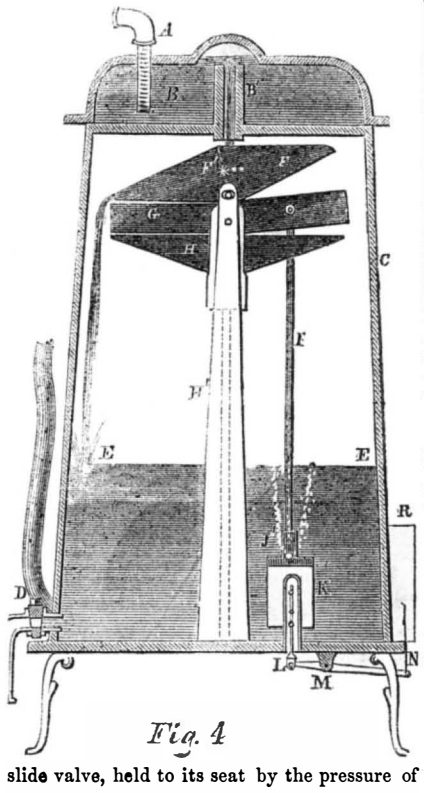

Fig. 4

slide valve, held to its seat by the pressure of the fluid within. A hollow projection, K, extends upward from the bottom into the interior of the case, A. Its interior communicates freely with the atmosphere, and its exterior is plane on one side and perforated, as represented in Fig. 2, the perforations being covered by the small slide valve, J. This slide valve is connected by the rod, I, to the lever G, and consequently moves vertically on the plane surface of K, at each movement of the latter.

The indicating mechanism is on the exterior of the case. It is similar to that ordinarily employed on gas meters and the like, and carries several indexes, which work on the face of corresponding dials, as represented by R, in Fig. 1. A ratchet wheel on the lowest and quickest shaft is operated by a pawl, which latter is connected to the work inside through the rod, L, which stands loosely enclosed in the interior of K, and is connected firmly to the slide valve, J, at the point, K′, Fig. 2. This connection avoids the necessity for a stuffing box.

When the valve, J, is in its lowest position, the water in its interior escapes through the aperture, K‴, and air from the interior of K flows in through the aperture, J, to supply its place. Now when, by the means described, the valve, J, is raised to its highest position (that represented in the figures) the air freely escapes from the interior of J through the cavity, J′, and water finds access through side openings, imperfectly represented by dots, so as to flow in through J″. At each movement of G, therefore, the indicating apparatus, R, shows that water has been discharged from the cup, F, and also allows a quantity of air to rise in bubbles through the water, as shown in Fig. 4.

The various pipes and cocks connected to the base of the case, C, serve to draw water therefrom in the usual manner. They may discharge it directly at the cock from which it is seen flowing, or may lead it in the pipe represented to any distance, and the whole apparatus serves as an air chamber to regulate the motion of the water.

The device for receiving air is made a little larger than necessary, in order to ensure a sufficient supply of that fluid within the case. Under ordinary circumstances, no harm can arise from a too great accumulation of air, as the aperture K″ which obstructs the water being higher than either of the other outlets, it simply follows that if the water surface becomes too low, small quantities of air instead of water are discharged through the cavity of the slide valve, J, and as the density of the air escaping is greater than that introduced, the effect of this device is to reduce rather than increase the quantum of air in the case, C; thus there is no possibility of too much air accumulating, except under unusual circumstances. In case the pressure in the street main should be suddenly diminished, in consequence of the bursting of a pipe, or of an extraordinary quantity being drawn out in case of a fire in the vicinity, the air enclosed in C, by expanding, might force its way backward into the main. To avoid this, the reservoir, B, is arranged, as represented, so that it will receive and contain any air which might thus be displaced, and hold it ready for discharge into the case C again, so soon as the pressure is restored. The inventor is ready to guarantee that these meters will operate perfectly without any attention for seven years, and it is presumed that they will endure for a much longer period without any derangement. This invention was patented March 24, 1857.

For further information, address the inventor and patentee, at his residence, No. 8 Tenth street, near Sixth avenue, New York.

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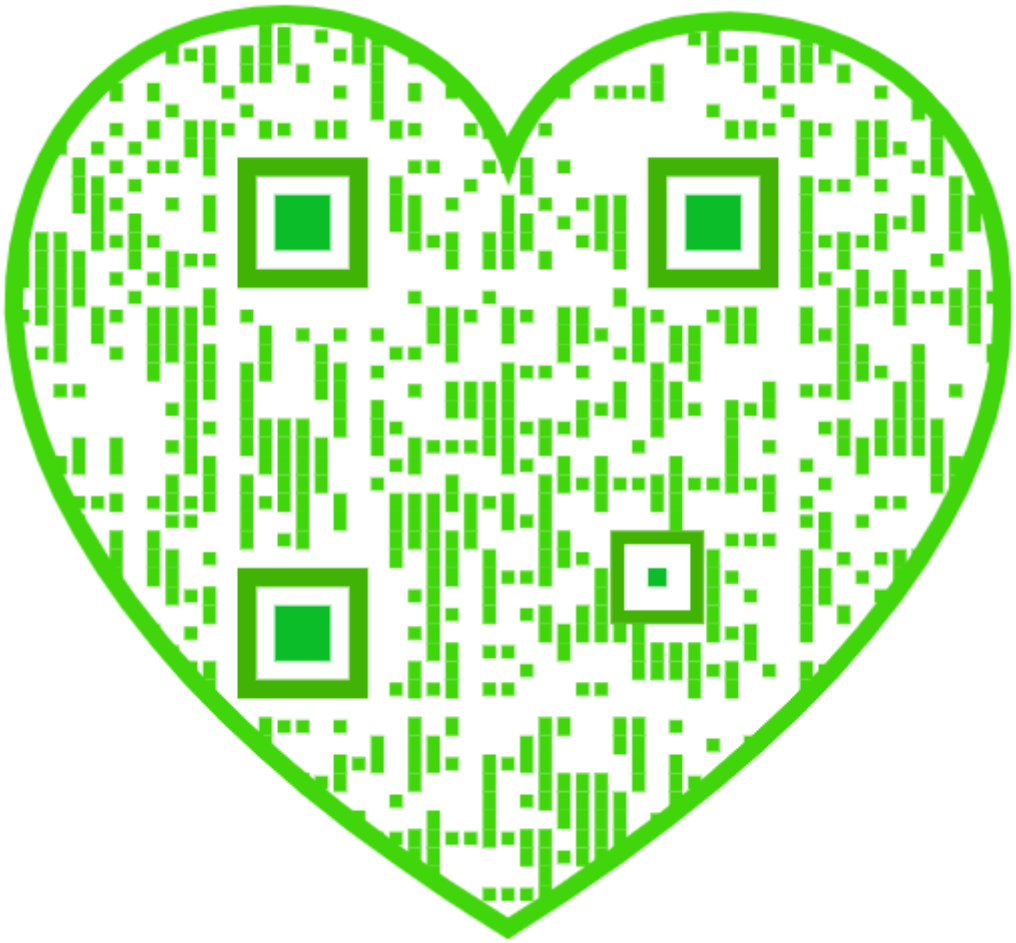

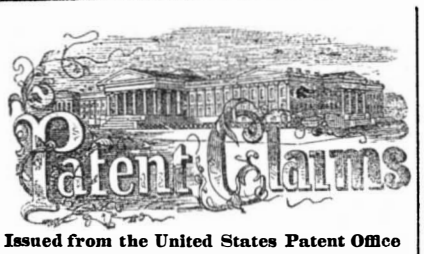

Issued from the United States Patent Office

FOR THE WEEK ENDING SEPTEMBER 1, 1857.

[*Reported officially for the Scientific American.*]

CUTTING CORN STUBBLE—John Augspurger, of Trenton, O. : I claim the described (or substantially equivalent) combination with the teeth of a rake, of rotating knives, for the purposes set forth.

THILLS—Philipe Baillau, of New York City: I claim the flat spring, a, or its equivalent, at the back end of the thills, b, arranged and operating in the manner and for the purpose substantially as described.

SEALING CANS—Edwin Bennett, of Baltimore, Md. : I am fully aware that caps and stoppers and other sealing devices have been employed in application to jars and vessels containing fruit or other substances, and consequently I do not claim any of said devices as known or used.

I am also aware that plastic and adhesive substances have been used and combined with caps and stoppers for various purposes, but I disclaim such materials and combinations.

I claim the construction of a cap formed with a flaring lip-like rim, b b b b, and groove or gutter, C C, and combined with a stopper part, d d e e, arranged and applied to an inverted jar, or other receptacle, in the manner and for the purposes substantially as set forth.

RAKES—Andrew J. Blodgett, of Newport, N. H. : I do not claim spring teeth applied to a rake head.

But I claim making each arched brace rod and one or two teeth in one piece of wire, and extending the same through the rake head, and into or through the handle, substantially as specified.

WIRING BLIND RODS—Byron Boardman, of Norwich, Conn. : I claim the means employed for feeding the staples, p', between the guides, d' d', and underneath the die or rod, K, that is to say, the plate, M, pivoted to the place, l', on which the staples are placed, and provided with the shoulders, n n', the plate being connected with the bar, f, by means of the rod, o', substantially as shown and described.

I also claim feeding the rod, G, underneath the guides, d' d', to receive the staples, p', by means of the bar, J, attached to the bent lever, I, in connection with the lever, E, said parts being operated by their respective springs, A' u, and also by the bar, f, as described.

I further claim the guides, d' d', arranged substantially as shown, to convey the staples to the rod, and at the same time also allowed to expand, so as to prevent the clogging of the same, in combination with the die or rod, K, for driving the staples into the rod.

[This machine affixes the staples to the vertical rod of rolling-slat blinds with very great accuracy and uniformity, and with great speed. The spaces between the staples may be lengthened or shortened by a simple adjustment of the parts.]

SPOOLING THREAD—Charles H. Bradford, of Lynn, Mass. : I do not claim combining with mechanism for rotating a spool or bobbin a mechanism for regulating the winding or laying of the thread on such spool or bobbin.

But I claim the improved mode of regulating the winding of the thread, that is, by causing the thread carrier to rest directly against and be moved and guided in its movements by the side of the helic coil on the bobbin, as stated.

COAL SIFTERS—William D. Brown, of Weymouth, Mass. : I claim the combination of the screen, J J, and the plates, K and L, placed in a vessel or machine, to be used as a portable coal hod and sifter, so suspended on an axis as to allow of an oscillating or swinging movement, all arranged and operating as in the specification described.

SEEDING MACHINES—Charles W. Cahoon, of Brooklyn, N. Y. : I do not claim the slide, b, nor the rock shaft, c, with the hopper.

Neither do I claim distributing or sowing seed broadcast by means of centrifugal force effected by the rotation of wheels ar cylinders, irrespective of the construction and arrangement shown.

But I claim the disk, H, and rock shaft, c, with its teeth, d, in combination with the funnel-shaped discharger, F, having spiral flanches, p, arranged substantially as and for the purposes set forth.

[This machine distributes either seed or fertilizing material in a very perfect manner, and without the employment of any reciprocating parts. The distribution may be very accurately graduated.]

STRAW CUTTERS—Aury G. Coes, of Worcester, Mass. : I claim my improved straw-cutting machine, constructed so that its bed and knife shall each operate with a compound motion produced by a lever, crank, fulcrum rod, and guides, arranged so as to operate together, substantially as specified.

ORE SEPARATOR—Thomas J. Chubb, of New York City: I do not claim the separation of substances of different specific gravities, by submitting them to the action of a blast of air through a screen.

But I claim first, The employment, in combination with an inclined perforated table or bed, and a bellows operating as specified, of a number of channels, applied and arranged substantially as described, relatively to the bed and to each other, to convey away the separated substances in different directions, as set forth.

Second, The division of a bellows, applied and operating in connection with a perforated bed, for the separation of articles of different specific gravity into numerous chambers or compartments, each having its separate valve or valves, and constituting in itself a complete bellows, for the purpose specified.

[These are other features of the device for which a patent was issued last week. See notice accompanying the claim on page 410, volume 12.]

WASHING BOTTLES—Henry N. Degraw, of Watervleit, N. Y. : I am aware that expanding brushes constituted similarly to the one described have been previously used for the same purpose, but they have been arranged in quite a complicated way, so as to preclude them from general use, on account of the cost attending their construction and keeping them in repair.

I do not claim separately, or in itself considered, the expanding brush, for that, or its equivalent, has been previously used.

But I claim the expanding brush formed of the brush bars, I J L, connected to the rod, F, and bar, G, as shown, and expanded and contracted by the lever, O, and spring, P, when said brush, thus arranged and operated, is used in connection with the sliding holder, R, for the purpose set forth.

[This is a very simple arrangement of the parts, and operates very rapidly and efficiently. We are preparing engravings to illustrate this invention.]

SWEDGING HATCHET HEADS—Levi Dodge, of Cohoes, N. Y. : I claim the apparatus described, viz., the block cheeks and former to be constructed and operated substantially as and for the purposes set forth.

LIFE-PRESERVING BERTHS—Elbridge Foster, of Hartford, Conn. : I claim the adjustable inflated keels, in the manner and for the purpose set forth.

SAWING STAVES—Peter Deal, of Amsterdam, N. Y., and James Greeman, of Northampton, N. Y. : We claim first, The combined method of supporting and driving cylindrical saws from their periphery, in the manner and for the purpose described.

Second, The arrangement on the interior of a cylindrical saw, of a supporting table, and an adjustable gage or guide, as described, by which the thickness of the stave is gaged, and it is guided during its passage through the saws, and one stave is prevented from passing each other, and jamming against and stopping the saws, or throwing the front stave off the side of the table on the bottom of the saws.

Third, The arrangement of a guard plate on the interior of a cylindrical saw, as described, for the purpose of preventing the sawdust and chips being thrown into the kerf of the stave.

Fourth, The method of diminishing the pressure of the curved surface of the stock against the periphery of a cylindrical saw, by pivoting the track on which the carriage holding the stock traverses, so that the pressure of the forward end of the stock will throw the track outward, and thus prevent the saw from binding in the kerf.

SAW CLAMP—Leonard O. Fairbanks, of Bridgeton, Me. : Now I do not claim a saw clamp made with jaws, and with a clamp screw extending through such jaws, perpendicularly to their holding faces.

But I claim my improved saw clamp, as made with its jaws, clamping device, adjusting screws and bed plate, arranged and applied in manner and so as to operate together, substantially as described.

I also claim making the stationary jaw with a groove, e, arranged in it, in manner and so as to operate with the movable jaw, when constructed and made to act with respect to the stationary jaw and bed plate, as explained.

LOCKING FAUCETS—Henry Getty, of Brooklyn, N. Y. : I claim, in combination, the L-shaped grooves, e h, at the upper part of the spring barrel, stop bar, f, and the secret stop arm, K, placed loosely over the valve stem, and attached to the screw collar, whereby facilities are offered for fastening the faucet closed, and also when necessary of placing it beyond the control of servants and others not entrusted with its management.

[The locking is performed by means of a secret screw, and may confine the faucet either in an open or closed condition. The faucet is also of superior construction in regard to several other points, one of which is the facility with which the parts may be made accessible for the removal and exchange of a spring, or the like.]

ANIMAL TRAPS—George Hart, of Granger, O. : I claim the arms, C" C", springs, E E, and ring, J, when arranged substantially as set forth, for the purposes described.

OPERATING THE CUTTERS OF HARVESTERS—James Haviland, of Milton, N. Y. : I claim imparting the requisite movements to the cutter blade of a harvesting machine, by means of the spirally grooved intermediate shaft, B, and the series of hemispherical or oval headed teeth, e e, projecting from the face of the main bearing wheel, A, and operating upon the said intermediate shaft, substantially as set forth.

SPIRIT STILLS—Edward Herring, of Walton-on-Thames, England: I claim first, Giving to the diaphragms which separate the chambers an inclination or fall towards alternate sides of the still, as described, for the purpose specified.

And secondly, I claim the introduction of hot air, substantially in the manner described, for the purpose of aiding in the evaporation of the wash, and keeping it in agitation, to prevent the clogging of the still.

SURF AND LIFE BOATS—Richard C. Holmes, of Cape May Court House, N. J. : I do not claim separately the buoyant chambers, the valves, or the water tank.

But I claim constructing a boat of the peculiar form described, and giving to a boat of that form buoyant ends, ballasting tank, and freeing valves, all constructed and operating substantially as described and for the purposes specified.

RAKING DEVICE FOR HARVESTERS—Stephen R. Hunter, of Cortlandt, N. Y. : I claim the rod, K, or its equivalent, and two gates, J N, applied to the machine as shown, the gates being operated from the wheel, E, by means of the cam, D', crank shaft, H, rod, L, and arm, M, arranged substantially as shown, for the purpose set forth.

[This is intended more especially as an improvement on the harvester formerly patented by the same inventor, but it may be applied with advantage to all which are similar in their general features. The raking is accomplished by the two gates alone, without the employment of any rake, properly so called.]

HUB FOR CARRIAGE WHEELS—James W. Jackson and Luther W. Burchinal, of Smithfield, Pa. : We do not claim a hub composed of two plates and corresponding tenons, within which the spokes are to be inserted.

But we claim making the mortises of the hub adjustable in two different directions, so that the spokes of the wheel shall be grasped on their four sides simultaneously when the two plates of the hub are forced together by the screw bolts, in the manner substantially as set forth.

FEED AND GIGGING FOR SAW MILLS—George D. Lund, of Yonkers, N. Y. : I do not claim separately the cones, F G', for they have been previously used; nor do I claim separately any of the parts shown.

But I claim the combination of the two cones, F G', the conical hub or boss, T, and pinion, S, on the sleeve or collar, R, placed on the sliding shaft, G, of the cone, G', and the gearing, a K N O, arranged as shown and described, for the purpose set forth.

[This device allows the log to be fed forward at any variable rate, and to be gigged back with an increased velocity. It can be applied to mills now running, at a moderate expense.

SACK FASTENER—William P. and Jacob E. B. Maxson, of Albion, Wis. : We claim a bag or sack fastener, consisting of a spring tongue pressing the string against a side flange or projection, so as to form a self-holding nipper clutch when the said sash fastener is made of a single piece of metal, cut and bent in the manner substantially as described.

CHIMNEY CAPS—Ira Mayhew, of Albion, Mich. : I claim the constant openings, A A A, immediately beneath the drip of the roof, B B B, in combination with the larger variable openings, C C C, which are furnished with valves, D D D, hung at points, F F F, and separated by the connecting rods below, as shown, for the purpose specified.

SHOWER BATH APPARATUS—William Meyer, of Progress, N. J. : I claim the lower rose, by means of which water can be thrown upwards, and a more perfect and thorough shower bath is obtained.

GAS REGULATORS—John H. Powers, of Newark, N. J. : I do not claim the connection of the valve with the inverted pressure cup by means of a lever.

But I claim the arrangement of the inverted cup-shaped valve, D, and its seat of quicksilver, and the lever, H, which connects the said valve with the pressure cup, all within the pressure cup, substantially as described.

[The automatic regulating of the pressure of gas is a subject which has attracted much attention. This is an improvement on the form of regulators, in which the opening is controlled by the pressure of the gas on an inverted cup floating on a valve seat of mercury.]

COTTON SEED PLANTERS—Thomas J. Rogers, of Cassville, Ga. : I claim forming one side of the eduction aperture of a cotton seed planter of the extremity of a sharply vibrating plate, when the opposite side of said aperture is formed of an adjustable flaring concave, substantially as set forth.

SEWING MACHINES—Orson C. Phelps, of Rochester, N. Y. : I do not claim the use of a spring immediately connected with the needle, or with the socket for holding the needle, or any spring attachment, for a similar purpose, not directly attached to the needle bar, as seen in the patent of I. M. Singer and others.

But I claim constructing the needle bar of sewing machines with a cap or helmet, D, on its top, and a spring, b, or other elastic material which is equivalent in its effect, as india rubber, air, &c., interposed between the parts, for the purpose of giving a yielding bearing to the thread bolt, but in drawing in the stitch, and when the shuttle passes the loop, whereby a very fine thread may be used without breaking, and a better seam produced, in consequence of the even tension of the thread and gradual drawing in of the stitch, as described.

LANTERNS—Joseph A. Rohrman, of Philadelphia, Pa.: I claim first, Constructing square frame lanterns with the corner uprights of square wire or metal rods, and the door frame of a single square wire or rod bent in U form, secured at its ends by a strip, the whole arranged as and for the purposes described.

Second, I claim in combination with square wire corner uprights, the peculiar attachment of the guard wires by simple grooves and dovetailed ends, as described, the whole constructed as and for the purposes set forth.

Third, Forming tongues, g, in the bottom and top plates, or either for spring stops to secure the glasses in position, and also for the admission of air necessary to the combustion of the lamp flame, substantially in the mannerset forth.

ADJUSTING CARRIAGE TOPS—C. W. Saladee, of Columbus, O. : Now I do not claim the lateral rod, D D, when placed on the outside of the seat back, for the purpose of adjusting the top, as new, Letters Patent having been granted to me for the same, dated September 9, 1856.

But I claim extending the top prop, A, back of the rest iron, B, a sufficient length to form the lever, C, in combination with the lateral rod, D D, as shown.

I also claim the scroll spring, E, in combination with the pivot iron, L, and the back bow, H, (or to either of the other three bows,) for the purpose of assisting in raising the top, and likewise to prevent its falling with the full force of its own weight, when in the act of throwing it back, substantially as set forth.

ATTACHING WHIFFLETREES TO TOW LINES—Andrew Seaman, of Amsterdam, N. Y. : I claim the shaft, C, with tongue, D, attached, in combination with the bar, E, with lever, F, attached, the above parts being fitted to the rods, B B, and the whole arranged substantially as and for the purpose specified.

[This is to facilitate the connecting and disconnecting of horses to the tow lines of canal boats, so as to avoid the liability of horses being dragged into the canal. The whiffletree is instantly detached from the tow line at any moment, by simply pulling on a loop, and thus moving a lever.]

SMOOTHING IRONS—Wm F. Shaw, of Boston, Mass. : I do not claim heating a flat iron by means of a lamp having its wick tube, or the flame of its wick, within the body of the iron.

Nor do I claim heating a flat iron by charcoal or other fuel burned in a chamber within the body of the iron.

Nor do I claim the application of a wire gauze or perforated chimney to an air and gas burner, so as to surround the flame, as such has heretofore been patented by me.

But I claim making the flat iron with ascending and descending flues, inlet and discharge openings, arranged the body of the iron, and so as to be used with a burner and stand, in manner substantially as specified.

PORTABLE GAS GENERATORS—Warren A. Simonds, of Boston, Mass. : I claim the tubular retorts, B and C, of the form described, operating in the manner substantially as set forth, for the manufacture of oil gas.

DRAWING THE CURVE OF CIRCULAR STAIR RAILWAYS—George S. Stewart, of Meadville, Pa. : I claim the construction of a machine with an adjustable table, D C, and the graduated post, B, and arm, T, adjusted with the set screws, Q i, and the semicircle, F, constructed as described, or any other substantially the same, and which will produce the same results.

SUSPENDING EAVES TROUGHS—James A. Watrous, of Green Spring, O. : I do not claim the suspending of eave troughs by bolts and nuts, as patented by Woodruff.

But I claim the employment of a metal strap, D', in combination with the cross bar and the slotted plate, C', for securing and readily adjusting eave troughs.

PLANING SAW TEETH—John N. Wilkins, of Waukegan, Ill. : I claim the two planers or cutters, j K, fitted within the case, A, and operated as shown, in combination with the guide or cross piece, d, within the case, the whole being arranged and applied to the saw as shown, for the purpose set forth.

[This machine shapes all the inclined edges of saw teeth with perfect uniformity and accuracy, and insures that in this respect the saw is in perfect order with very little trouble and expense.]

FORGING METALS—Elbridge Wheeler, of Feltonville, Mass. : I claim operating the roll, B, at stated intervals, by means of the described arrangement of cams and levers, or their equivalents, whereby I am enabled to roll a piece or bar of metal to a given pattern, in the manner substantially as set forth.

PIPE COUPLING—E. Wright, of Boston, Mass. : I claim the use of a compressible packing ring inserted in a groove around the pipe on each side of the joint, in combination with screw threaded or flanged and bolted couplings, and a thimble for holding the packing ring in the grooves, so as to form a water-tight joint and resist separation, by the packing ring serving as a dowel.

PERCUSSION CAP PRIMERS—George W. Baker, of Burlington, Vt. : I claim as a new article of manufacture the described percussion cap primer, whose improvement consists in the peculiar construction which enables one side of the case of said primer to serve as an elastic cap retainer at the side of the outlet of said case, substantially as set forth.

MOVING STORES, &C., IN CASE OF FIRE—Asa Blood, Sen., of Norfolk, Va., and Robert W. Brown, of Washington, D. C. : We claim the manner described for moving the adjustable stalls, by means of the lever, E, rod, F, and clinch, H, on rollers, I, and track, O, as set forth and described.

ATTACHING SCYTHES TO SNATHS—Oliver Clark, o Henrietta, O., (assignor to Aaron H. Pinney, of Columbus, O.) : I do not claim the making of a scythe with a curved heel, as I claimed that in my former patent.

But I claim the metallic block, A, in combination with styrrup bolt, e, collar, f, and scythe heel, d, constructed and arranged in the manner and for the purpose set forth.

SLIDING REST FOR LATHES—E. S. Gardner (assignor to Smith, Gould & Co.) of Philadelphia, Pa. : I claim the revolving collar, C, with its square eye, G, when the same is employed in conjunction with the steady rest of a turning lathe, for which a patent was granted to Albin Warth, on the 10th day of October, 1854, in the manner and for the purpose set forth.

CROZING AND CHAMFERING STAVES—H. L. McNish, of Lowell, Mass., assignor to D. C. Butler and H. L. McNish, aforesaid : I claim the self-opening and closing clamp described, or its equivalent, so geared to other parts of the machine as to operate periodically corresponding with the motion of the feed rollers as set forth.

I also claim making the clamps adjustable to croze staves of barrels of different diameters as set forth.

CONDENSERS FOR LIST SPEEDERS—Wm. Mattison (assignor to J. C. Whitin) of Northbridge, Mass. : I claim the self-adjusting weight or condenser, F', applied in the manner described, and retained in its position by the casing or bonnet G, or its equivalent, substantially as described for the purpose specified.

HEAD RESTS—Wm. M. McCauley, (assignor to J. N. McIntire) of Washington, D. C. : I claim pivoting the rocker or shank, A, of the head plate in the stationary holder, C, in combination with the segmental spring, e, whereby the head plate accommodates itself to any inclination of the head, and forms a springing or elastic support, the whole constructed and operating substantially as described.

I do not broadly claim pivoting the head plate to the stationary holder.

CARDING ENGINES—H. N. Gambrill and S. F. Burgee, of Woodbury, Md. Patented in England April 14, 1857. I claim delivering the cotton on to the main cylinder always at two, and sometimes at three different points or places, whilst using but one set of feeding rollers, substantially as described.

We also claim the combination of the working cylinders, B D, and the working and stripping cylinder, E, all running in the same direction, and working in connection with each other, and with the main cylinder as set forth, the two first, B D, delivering the cotton to the main cylinder regularly, whilst the latter E is doing so at intervals, substantially as described.

We also claim mixing the strippings taken from the main cylinder by the stripping cylinder E, with the cotton on the cylinder D, carding it and returning it, thus mixed and carded to the main cylinder, substantially as set forth.

We also claim, in combination with the cylinders, the stationary casing and the concave for separating the dirt from the cotton, whilst undergoing the carding process as set forth.

We also claim, in contradistinction, from giving the variable motion to the cylinder, E, by cone pulleys, and a traveling belt attached to each carding engine, the giving of said motion to a shaft or line of shafting, and imparting it from said shafting to the engine by simple belt and pulleys, by which means more certain action is had and at less expense, as set forth.

CASTING BEARINGS IN IRON WHEELS—Chas. Taylor, of Little Falls, N. Y. : I claim the employment of the bevel or oval cap piece, A, or its equivalent, when it is used in connection with the pins, B B, or their equivalent, and made to operate in the manner and for the purposes described.

SOCKET COUPLING FOR LATHES—G. N. Trowbridge, of Lowell, Mass. : I do not claim a simple conical pin for fastening the shank of a tool in a conical socket, but I claim the combination of the spring E and pin F, with the conical shank and socket, with straight screw attached, for the purpose and substantially as described.

RE-ISSUES.

LOOMS—D. W. Snell and S. S. Bartlett, of Woonsocket, R. I. Patented January 13, 1857 : We do not claim priority in using "strain" as a means of regulation, for under various modifications, it is found in use. For instance, Hendrick employs strain acting upon or with the movable reed as his regulating feature; also, Stone, Potter and others, their motions acting in combination with an intermittent take-up motion; Knowles, Boyd, Bigelow, Mason, and others, use one or more stationary or reaching vibratory whip-rolls as their point of regulation, while Taylor and Wilcox and others employ the beam as a means of regulation.

But we claim, first, Employing the positive take-up mechanism or cloth roll, or any mechanism acted on or affected by the strain of the cloth, when a positive take-up is used as the point through which the variable strain and wind of warps is made to act more sensitively than from or by the variable vibratory re-acting motion of the whip rolls, or sudden jerking of the beam or movable reed.

Second, Effecting and producing a regular delivery and uniform strain of the warps by the equalizing strain lever, P, or equivalent, said lever being acted upon by the variable strain of the warps or cloth, through the positive take-up mechanism or cloth roll, as represented.

Third, The equalizing strain lever, P, or analogous device, when operating in connection with the positive take-up mechanism or cloth roll or when effected by the strain of the cloth, in combination with any mechanism for producing a rotary motion to the beam, and with any device or means for regulating the delivery and strain of the warps as the beam decreases in diameter, and as the desired strain requires.

Fourth, Employing the rod T, with the pin X, or equivalent, to act upon the strain lever, P, as a means of moving the weight, K, when the balance spring, S, or equivalent device is not sufficient to move it.

Fifth, In combination with the pulley, F, and pinion, C, we claim the movable weight, L, the fixed or yielding sectional friction piece G, and friction lever, J, as and for the purpose represented.

Sixth, In combination with the weight, K, and friction lever, J, we claim the rack N, or its equivalent, to so act upon weight K, through catches L, or analogous devices, as to gradually move this weight, K, towards the fulcrum of lever J, as the beam decreases in diameter, and as the desired strain of warp requires.

Seventh, In combination with the weight, K, and friction lever, J, or equivalent devices, we claim the jointed or stationary sectional friction piece G, and set screw, H, as and for the purpose represented.

CARDING ENGINES—Wm. H. Walton, of New York City. Patented Dec. 9, 1856. Re-issued Jan. 13, 1857 : I wish it to be distinctly understood that I do not claim two sets of feed rollers combined with a carding machine, as they have before been used. Nor do I claim two independent "lickers in" working on to the main cylinder, when they are not used as "workers together," as they are on machines previously devised.

But I claim suspending the top flats or workers upon pivots in the center of their ends, by which they can be raised out of the way of the adjoining flats, and turned by a rack working into pinions or the equivalent thereof, the whole being constructed and arranged substantially as described for the purpose set forth.

I also claim stripping the flats or workers by a rotating brush, so arranged that a card may strip the brush, and return the strippings to the main cylinder, substantially in the manner and for the purposes described.

I also claim the combination and employment of two or more "lickers in," acting as "lickers in" and "workers," by running in contact with each other, or their equivalent, for the purpose of working the fibre before it enters on to the main cylinder, in the manner specified and for the purposes set forth.

DESIGNS.

STOVES—N. S. Vedder, of Troy, N. Y., assignor to North, Chase & North, of Philadelphia, Pa.

STOVES—Thomas Barry, of New York City.

Printing from Veneers.

A process of veneering by transfer is mentioned with approval in the French journals. The sheet of veneer or inlaying to be copied is to be exposed for a few minutes to the vapor of hydrochloric acid. This novel "plate" is then laid upon calico or paper, and an impression struck off with a printing-press. Heat is to be applied immediately after the sheet is printed, when a perfect impression of all the marks, figures, and convoluted lines of the veneer is instantaneously produced. This process, it is affirmed, may be repeated for an almost indefinite number of times. The designs thus produced all exhibit a general wood-like tint, most natural when oak, walnut, maple, and the light colored woods have been employed.

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[For the Scientific American.]

Operating the Cutters of Reaping and Mowing Machines.

One of the greatest defects of reaping and mowing machines, practically considered, consists in the present mode of operating the cutters. It being necessary that the cutters should have great speed in order to do good work, it becomes necessary to use, as is the case in most machines, a series of spur or cog gearing. The objections to this mode of operating the sickle are various. One of these, and perhaps the greatest, is the constant liability of the cogs to break, which is a far more serious matter than a person at first might suppose. To illustrate this, let it be supposed that a farmer hires his binders, rakers, &c., and all being ready, the weather fine, all hands go to work, but before the machine has cut a half dozen times across the field, snap goes two or three cogs. Now, to get the machine in working condition again is no easy matter, for perhaps the nearest shop may be two or three miles distant, and hours, under the most favorable circumstances, must elapse before the machine can take its place in the field again; during all which time the hands are comparatively idle, although at the same expense to the farmer as though at work. There is also an objection to gearing on account of the great noise which it makes when driven at the high speed necessary in reaping and mowing machines. To remedy the above objections, I dispense with cog gearing entirely, while at the same time I am able to use a small driving wheel, and yet get the requisite speed. The plan consists in placing on the main shaft, and close to and on each side of the main wheel, a cam wheel. I then attach two treadles, one on each side of the main wheel, to the rear portion of the frame, the front ends of the treadles projecting in front of the main wheel, while friction rolls attached to the treadles near their middle rest on the cam wheels. I now attach a chain or rope to the front end of one of the treadles, pass it down and once around the short crank shaft which operates the cutter bar or sickle, then up and make it fast to the front end of the other treadle. Now, as the machine moves along, a rapid reverse rotary motion will be given to the shaft, and a reciprocating motion to the cutters.

This is undoubtedly the most simple, easiest and least liable to get out of order, where great speed is desired, of any mode now in use. If any one doubts this, a simple experiment will convince them of the fact. To make the treadles work more even and easy, if desired, the chain or rope may be attached to a stiff spring, fastened to the upper side of the treadles. It is not necessary that the chain or strap should be continuous, as the treadles may be attached to different straps or chains, so that as one is wound up the other will be unwound. A clutch may be used on the short shaft to throw the sickle out of work.

INVENTOR.

[The above strikes us as being an excellent improvement. Farmers will be interested in its practical success.—ED. SCI. AM.

Do Alkalies Injure the Teeth?

MESSRS. EDITORS—The item which you publish in the SCIENTIFIC AMERICAN of the 29th ult., in reference to the action of alkalies upon the teeth, and in which you state that "some of the dentists at the late dental convention in Boston asserted that the main cause of defective teeth was the use of saleratus and cream of tartar in the manufacture of bread," conveys a wrong impression of the facts in the case, and as it involves a very important question, deserves to be set aright.

The subject under discussion was "the best means of securing a healthy denture," when a person in the convention, who has, for many years past, been recognized by the dental profession as a monomaniac on alkalies, asked leave to read a paper on topics connected with the question. Liberty being granted, the person produced a long article, cut from some newspaper, and proceeded to read the same. It was not well received by the convention. It was looked upon as discourteous, that a scientific body of men meeting to listen to original thoughts, should have forced upon them an ill-prepared and unscientific newspaper article of two or three columns in length.

The object of the article in question evidently was to bolster up the ancient and exploded theory that alkalies, as used in the process of bread-making, injure the teeth. There was no argument to sustain this position, but simply quotations from the writings of Harriet Beecher Stowe, and others of like *scientific* attainments, tending to show that an excess of alkali in food had in some boarding-houses occasioned disease, not of the teeth, but of the body. The author of the paper had also destroyed teeth by soaking them in a saturated solution of saleratus for fourteen days.

With the reading of the newspaper article, the argument in support of the ruinous effects of alkalies dropped. Some forty members of the convention, many of whom are in possession of an enviable and almost world-wide reputation as scientific men, spoke upon the subject, and not a voice was heard in favor of the alkaline theory. Professor Chapin A. Harris, of the Baltimore Dental College, opposed the theory with much energy, stating that the teeth being made up largely of phosphate of lime, possessed no affinity for alkalies, which could act, even in their most concentrated form, only upon the *cementum* or animal matter of the exposed *bone* of the tooth, leaving the dense covering of enamel very slightly disorganized, except by the action of a positively caustic alkali, and even this acting with feebleness. Dr. Fuller, of Portsmouth, N. H., contended that the human teeth are very rarely if ever exposed to the action of alkalies. The saleratus or soda used in bread is intended to unite with the acetic acid generated by decomposition, or, where cream of tartar is also added, the release of carbonic acid gas, which renders the bread cellular and porous, is effected; in either case the acid is neutralized by the alkali, and a minute quantity of the slightly laxative substance known as Rochelle salt only remains.

Upon one point the intelligent members of the profession seemed united — that *acid*, whether generated by the decomposition of particles of food in contact with the teeth, or taken into the mouth in the form of ascetic acid, as vinegar, malic acid or the juice of apples, citric acid or lemon juice—or whether occasioned by an acidulated condition of the body—in whatever form, acid is the great destroying agent, the great decomposer of the enamel and bony structure; and every year's investigation adds its accumulating evidence in support of a theory which chemistry and intelligent observation have placed upon a reliable foundation. Cleanliness especially, and the use of moderately alkaline washes, when indicated by the proper tests, may be considered as the best means of guarding against decayed (or what is the more correct term, *dissolved*) teeth.

DENTIST.

Saw Gummers.

MESSRS. EDITORS—In your issue of August 8th, Mr. I. S. Westbrook, of Georgia, asks for information as to where the best circular saw gummer can be obtained. We are aware that this is a question frequently asked by owners of circular saw mills, and one, we believe, never satisfactorily answered, until Mr. Dole demonstrated to us that his improvement could be successfully used on the largest class of circular saws. We have purchased one of these gummers, made by Messrs. Dole, Silver & Flech, Salem, Columbiana Co., O.; and we would cheerfully recommend Mr. Westbrook and others, who are similarly situated, to procure one, as we believe them to be admirably adapted for use on circular saws.

E. J. PRUNER & Co.

Tyrone City, Blair Co., Pa., Sept., 1857.

[This invention was illustrated on page 140, last volume, SCIENTIFIC AMERICAN, and we are glad to hear so good a report of the practical success of the machine.—EDS.

Patent Extensions—Mismanagement in the Notices.

Considerable anxiety is just now manifested among many patentees to procure renewals of their patents which are about to expire. This desire is evidenced in the annexed list of petitions now before the Patent Office :—

Improvement in Ship's Blocks.—J. D. Russell & S. Waterman, of New York. This patent was originally granted on the 31st of January, 1844. The case is to be heard on Monday, the 11th of January next.

Type Casting Machine.—David Bruce, Jr., of Brooklyn, L. I. Granted November 6, 1844. The hearing of this case is set down for the 26th of October.

Straw Cutters.—H. M. Smith, of Richmond, Va. This patent was originally issued on the 20th of February, 1844. The day of hearing is set down for the 18th of January next.

Railroad Car Springs.—James Millholland, of Reading, Pa. As this patent expires on September 23, the case is to be heard on the 21st. Doubtless it is a valuable improvement, as otherwise Mr. Millholland would not ask for an extension of the patent.

Carriage Brakes.—David H. Woodward, of Pennsylvania. This patent will expire on the 4th of December. The day of hearing is set down for the 23d of November next.

It should be borne in mind that persons desiring to oppose these extensions are required to file their objections in the Patent Office at least twenty days before the day of hearing.

We have now a "bone to pick" with the late Secretary of the Interior, on the above subject. It will be remembered by many of the readers of the SCIENTIFIC AMERICAN that for some months during the last Administration, notices of petitions for extension were "officially" published in our columns. Soon after the appointment of Judge Mason to the office of Commissioner of Patents, one of the members of our firm, being then in Washington, waited upon the Commissioner, and explained to him the absurdity of publishing such notices in exclusively political journals having a mere local circulation. The justice of our position was at once acknowledged; and, with that desire always shown by Judge Mason to render the Patent Office management unexceptionable in its bearings upon the interests to be affected through its agency, he ordered the notices to be regularly sent for publication in the SCIENTIFIC AMERICAN, where they attracted the attention of parties likely to become interested in opposing such extensions. Not long afterwards there was in process of hatching another scheme, on the part of the Secretary of the Interior, to get a few more of the noble apartments designed to accommodate the future expansion of the Patent Department. We opposed this scheme in round terms, as we felt bound to do by every sense of right; and, as a natural consequence, the "official" list of notices intended for publication in our journal was stopped by the edict of the Secretary.

We cared very little for these notices—in fact, they were something of a burden upon our space; but we thought it would look quite as well for all concerned to consult the proper interests in managing such matters. It is a pity—nay, it is a shame—that the federal government cannot be made to overlook party claims in matters so clearly above and beyond the reach of party influences. The above specified five cases were accidentally discovered in the columns of an obscure print published in this city, otherwise our readers might have waited till August, 1858, for the appearance of the Commissioner's Report, in order to be informed that extensions of such and such patents had been solicited and granted. This dim and tardy system is all wrong, and ought to be remedied.

Apparatus for Navigating the Air.

In rambling through the various avenues of speculative and practical science in search of novelties, we sometimes stumble upon curious customers; and with a desire to strike chords which will send their vibrations into every department where genius finds lodgment, we introduce to our readers, from the London *Engineer*, a description of the ærial chariot of Viscount Carlingford, of Kilkenny, Ireland, whose invention has recently received the Great Seal of the British Patent Office, which, by the way, is as large as a good sized turnip, and is a relic of the barbarous ages :—

"The ærial chariot is made something in the shape of a boat, extremely light, with one wheel in front and two behind, having two wings, slightly concave, fixed to its sides, and sustained by laths, of a half hollow form, pressing against them, and communicating their pressure through the body of the chariot from one wing to the other, and supported by cords, whose force, acting upon two hoops, nearly of an oval shape, hold the wings firmly in their position, using a force that cannot be less than ten tuns, on the principle of corded musical instruments. The ærial chariot is provided with a tail that can be raised or lowered at pleasure, for the purpose of giving an elevating or declining position, and worked by a cord that communicates with the interior of the chariot, which is drawn forward by an ærial screw, of the perfect form of the screw propeller, which screws into the air at an elevation of 45 degrees, similar to the bird's wing, and is turned by means of a winch acting on three multiplying wheels. The wings of the chariot are covered with a network of a lengthened square shape, which produces the effect of bird's feathers when the chariot floats on the air, covered with silk, at which time may be seen its impression with the points forward and the same backwards, by which no pocket, as it were, can be formed by the pressure of the silk on the air. The upper part is finished in the same manner, and both sides of the wings are covered with varnish. The body of the chariot, the wings, and all of it in general, is made of very light wood, with few exceptions, weighing in all from four to six stone, and covering a space from twenty-five to thirty feet square, or according to the weight it is intended to carry. It can also be constructed and considerably increased in size to carry very superior weights, yet the wings will not require to be increased in the same proportion; as, for instance, we see the eagle weighing eighty pounds and upwards while the rook weighs one pound, yet the eagle has only four times the floating surface of the rook. There is also a rudder to the ærial chariot that has something the appearance of a small sail, but, contrary to the rudder; it is worked at its distant extremity by a cord that communicates into the chariot."

We shall be happy to see the Viscount, whenever he may decide to light upon us in his ærial car, and we hope he will not forget to bring along with him a few specimens of the Kilkenny cats.

Drying Sized Paper.

L. C. Stuart has recently taken out an English Patent for an improvement in the above process, which consists in passing the sized paper over and between a series of oblong cylinders, placed one above the other, and having their surfaces perforated with small holes, through which currents of graduated heated air are forced, which escape and come in contact with both sides of the paper after leaving the sizing vat. The series of cylinders and the paper between them are exposed to the open air, so that the vapor may be free to escape, and not run with the paper to be again absorbed by them.

The novelty of this improvement consists solely in the perforated cylinders, as it is common in this country to employ steam-heated rollers for the same purpose.

Artificial Marble.

M. Felix Abate, of Naples, recently communicated to the French Academy of Sciences, a new system of moulding which gives to plaster the hardness and durability of marble. He proposes to employ this substance for all ornamental purposes where marble or stone has been previously used; and from calculations which he has made, he is of opinion that it will cost only one-fifth of the best cut stone.

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New Inventions.

Patent Sleigh.—Collecting Agents.

A correspondent writing from western Pennsylvania, informs us that an agent is traveling through that region, endeavoring to collect damages for the infringement of a patent for placing the dash-board on the outside of the rave of sleighs, and inquires of us if any such patent has ever been granted. For the benefit of all concerned, we would state that Moses Miller obtained a patent in 1846 for an improvement in sleighs, the nature of which is fully exhibited in the claim here annexed:—

"What I claim, is the manner of combining the dash-board with the raves or frame-work of the sleigh; the dash-board being affixed on the outside of the raves, thereby admitting of its being widened out so as to constitute wings, whilst under the peculiar arrangement set forth it may be disconnected for the purpose of repair, and replaced at pleasure. To this manner of combining the dash-board with the raves I limit my claim."

Improved Reaper and Mower.

The single engraving here presented exhibits very clearly the harvesting machine invented by Mr. B. F. Ray, of Baltimore, Md., and for which Letters Patent were granted February 5, 1856. Foreign patents for this invention—the English dated February 18th, and the French April 3rd, of the present year—have also been secured through our Agency.

A is the stout driving wheel, which supports a large portion of the weight, and, as is common in all harvesters, by its revolution works the cutter bar, B. These features, as also the light supporting wheel, E, on the opposite side of the platform, D, the shoes, F and G, the seat, H, for the raker, and the stout frame, I, surrounding the driving wheel, are common to most machines for this purpose. The chief merits peculiar to this invention lie in the means by which the motion is communicated from A to B, and in the means by which the interior of A is protected from the presence of dirt, straw, and the like. A is mounted on a short fixed axle, one extremity of which is seen at J. A broad light plate, K, is provided which is supported partly upon J, and partly by brackets fixed for the purpose on I; and as this plate covers nearly the whole of the wheel within the rim, it effectually protects it from any injury. In the engraving it is represented as open near the top, a construction which is not objectionable, as the danger of injury from substances falling in at so great an elevation is very slight; but the only *necessary* opening in the plate is to allow the taking off of the reciprocating motion, the means for which we will now describe. A deep and broad continuous groove, L, curved as represented, is formed within the wheel, and extending quite around it. The stout casting, M, which is fixed on the frame, I, supports a stout slide, N, on the opposite sides of which are projecting pins. These pins carry anti-friction rollers—the one on this side being plainly represented. The stud and roller on the opposite side of N, reaches through a suitable opening in K, (not represented) and stands in the groove, L, so that as the driving wheel, A, revolves by its adhesion to the earth, the slide, N, is rapidly reciprocated forward and backward; the roller seen on this side simply serving, by its contact with the under surface of M, to defend it from any injurious twisting strain. P is a short upright shaft, with two arms, R and S, extending at right angles each to the other. R extends toward the driving wheel, and connects, either directly or through the intervention of a short link, to the hinder extremity of N. S extends forward, and connects to the cutter bar, so that the latter is thus reciprocated without the intervention of any gearing or complex devices for the purpose. The only delicate parts, if such they may be called, in the train which conveys motion to the cutter bar, are the shaft, P, and arms, R and S, which together constitute in effect a bell crank lever, and are effectually protected from injury by the shoe, G, which precedes it in passing into the grain.

The tongue, T, of the machine, is fitted in the usual manner, to allow the machine to ride over inequalities in the earth, and the whole is well balanced and adjusted to reduce the side draught, etc. For traveling, when it is not desired to cut, the pin, V, which connects N to R, may be removed, and in this condition the slide, N, reciprocates alone, without conveying any corresponding motion to the cutters. We consider this, in every important respect, one of the best reaping and mowing machines yet introduced.

For further information address John S. Tough, 13 Exchange Place, Baltimore, Md.

RAY'S REAPER AND MOWER.

WILLSON'S SAWING MACHINE.

Fig. 1

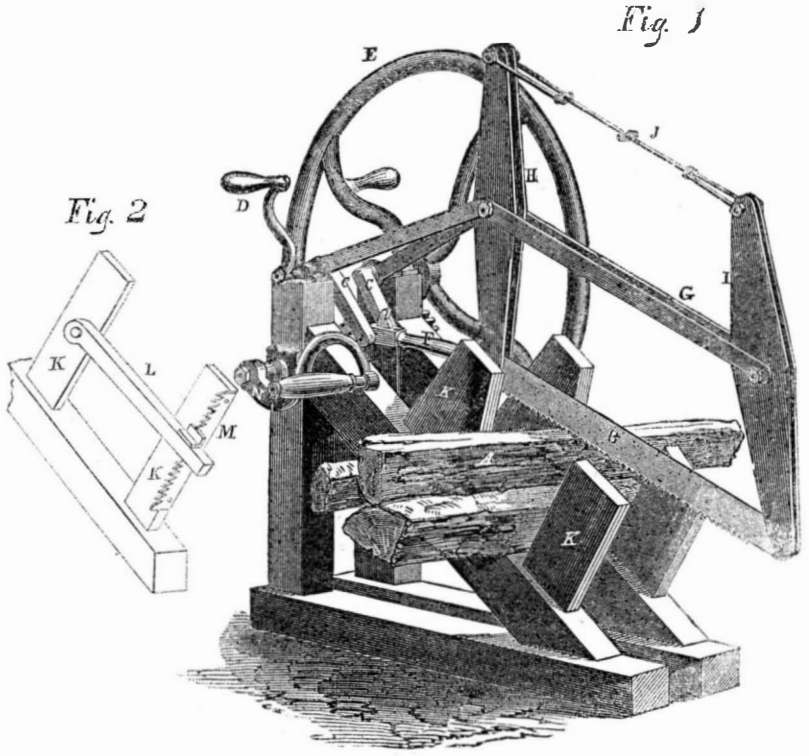

Fig. 2

This is one of the many devices brought forward to facilitate the labor of sawing, by connecting the saw to a crank worked either by hand or by power. Its simplicity and obvious freedom from the difficulties attending many other plans for this purpose recommend it especially to attention. The saw is mounted in an extremely simple frame, which is hinged at one end to the crank shaft. The saw is held between two levers mounted in this frame, and reciprocated by a simple connecting rod extending to the crank pin. The frame is, in fact, merely two bent pieces of wood or metal, and the saw and levers, when at mid-stroke (the position represented in the drawing) resemble an ordinary wood saw. The machine has been put to practical use on a large scale, driven by power, and is said to be very convenient and effective.

Fig. 1 is a perspective view of the machine as constructed for use on a small scale, and Fig. 2 is an outline of the manner by which the wood is confined in the buck, K K, and prevented from moving or rolling under the action of the saw.

A is the wood to be sawed, piled in between uprights, K, and held down by a binder, L. B is the saw, and C the crank which gives it motion. D is a hand-crank connected to the same shaft, to provide for working the saw by hand. E is a balance wheel to steady the motion, and F a connecting rod which communicates the motion of the crank, C, to the saw, B. G G represents the two parts of the frame referred to, and H I the reciprocating beams which support the saw. J is a tie or straining rod, by which the saw is stretched, and which may be lengthened or shortened by any of the ordinary means. M is a rack to aid in confining the binder, which holds the wood firmly in place. N is a crank which may be fitted at pleasure on a shaft geared to the cranked shaft before described. When it is employed, the upper hand crank, D, must be removed. Either crank, D or N, therefore, may be employed to give motion to the saw, according to the velocity with which it is desired to vibrate the saw, or according to the strength of the men employed.

The weight of the frame and attachments holds the saw to its work, but should it be desired either to increase or lessen this force, the frame may be partially supported or urged down by a cord and chain attached. The crank, D, is, of course, replaced by a pulley to receive a belt, when it is desired to drive the machine by steam or horse power.

It is obvious that this device possesses several advantages over many which have been brought forward for the purpose for which it is intended. One of these is its simplicity, and another is the fact that the saw is efficiently strained, and that therefore a thin saw may be made to serve, and thus, by diminishing the amount of wood removed at a cut, cause it to require less power.

The patentee affirms that a power saw, eight feet long, thus mounted, and driven at the rate of 600 strokes per minute, has sawed half a cord of wood in five minutes and twenty seconds.

The inventor of this arrangement is H. F. Willson, of Elyria, Ohio. It was patented June 30, 1857. For further information, address Messrs. Willson & West, Elyria, Loraine county, Ohio, who are constructing the machines, and are prepared to receive orders for them.

Fire-place Shutters.

It is stated that in some of the first class houses recently erected in England, fire-place shutters are provided, which, when partly down, act as powerful blowers, and when wholly drawn down, so as to touch the hearth-stone, entirely close up the fire-place, and rapidly put an end to the combustion of the fuel in the grate, or that of the soot in the chimney, should the latter accidentally take fire.—*Exchange.*

[This is a very old affair. It ranks among the oldest and most expensive inventions known for the purpose

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Scientific American.

Birthday of the Scientific American.

We greet our friends with gladness at this time, for it is our birthday anniversary. The SCIENTIFIC AMERICAN is twelve years old, and now begins its thirteenth year. This seems but a small period of time; but in its scientific achievements it equals, if it does not exceed the preceding half century.

Let us look back a little, and note a few of the prominent steps in progress and discovery which have been chronicled since our journal entered into existence.

The number of new inventions patented in this country during the past twelve years is about 15,500. The total number of patents issued during the preceding *seventy-five* years was 14,500. This is a deeply interesting fact, as it shows how ideas beget ideas—how one invention is the parent of another. It substantiates the oft-expressed opinion that mind has only just begun to exercise its control over matter, and leads to the irresistible conclusion that far more wonderful things are yet to be revealed by the workings of human ingenuity than any that have hitherto been produced.

The Electric Telegraph, as a practical invention, was only a year old when the SCIENTIFIC AMERICAN started in life. The first forty-four miles of telegraph had just been put in operation. There are now in operation and under construction throughout the world about *eighty thousand miles.*

Twelve years ago, the people of different continents were, in a great measure, isolated from each other. The pathless waters cut them off, as mankind then believed, from all communication, save by the slow and dangerous process of navigation. But now, on wings of lightning, defiant of wind or wave, messages of peace and good-will glide through the world. It is not probable that a submarine telegraph cable could have been successfully constructed twelve years ago, for it is only since then that the wonderful gum, Gutta Percha, has been made known and utilized. As an electrical insulator, gutta percha stands almost next to glass.

Twelve years ago, the artist's pencil, slow and distorted, was almost the only means known whereby natural objects were capable of being reproduced. But drawing lessons have been taught to the Sun, and now he gives us any picture we may desire, *in an instant.* Nor is he particular as to the substance upon which he paints the object; metal, glass, canvas, leather and wood, all are alike available to him.

In chemistry, what wonders have been developed within twelve years! Oil made from coal has become a common article of commerce. The fishes that inhabit the great deep no longer constitute the chief sources of our oleaginous products. The touchstone which actually converts base metals into gold and silver, has not, it is true, been discovered, but a new metal, wonderful and precious in its character, has been produced from common clay.

The shrieks of patients, writhing under the surgeon's knife, are now no longer heard. Somniferous chloroform soothes the nerves, and brings "deep sleep" upon its subjects. And thus we might proceed to a far greater length in the enumeration of the prominent discoveries of the past twelve years; but time and space forbid.

Great, however, as has been the progress during the period named, somehow, it does not seem to us that the past year has produced its proper share of important novelties. The Atlantic Telegraph Cable looms up as the most striking enterprise of the day. But at present we can only glory in the uncommon length of its wires. The year, however, has been more fruitful in new inventions, so far as number is concerned, than any preceding twelve months. Yet among these inventions do we find as many of a strikingly original character as might be expected? We think not. It seems to us that inventors and thinking men have confined the workings of their genius too much to the alteration and adaptation of old things. Now while we would not ignore, or attempt to depreciate the value of these labors, and their results upon our industry, we would urge them to still higher attainments. In the year which is now opening before them, let each try, if possible, to originate something which shall be wholly new, not neglecting, of course, the apparently less important subjects. "Progress" is the watchword.

Our readers will notice that the SCIENTIFIC AMERICAN is printed upon new type, and is improved in other respects. With the new year we have "turned over a new leaf." We have determined to make our paper as much more interesting and useful than ever as it is possible. For this purpose we invite assistance from all quarters. We shall be happy to receive communications for publication upon all subjects connected with science and art. We shall, of course, exercise proper discrimination, and reject whatever we deem unsuitable to instruct and interest our readers. Thankful for the kind favor with which our efforts in past years have been seconded, we invite the co-operation of our friends throughout the new year which we now inaugurate.

Contradictions and Curiosities in Science.

The curiosities and contradictions of science, while they go to show the "eternal fitness of things," also prove that we live in a world of paradoxes, and that existence itself is a whirl of contradictions. Who would suppose, for instance, that water—which everybody knows extinguishes fire—may become fuel to a flame, so that the "coming man" who is to "set the Hudson river on fire," may not be far off. With the assistance of water and fire, elements which have befriended the magicians of every age, contradictory wonders of a marvelous character may be exhibited, and even the hitherto secret art of handling red-hot iron and other metals, and of walking through a fiery furnace may be revealed.

If we take some mystical looking gray globules of potassium, and sprinkle thereupon water, that fluid will instantly appear to ignite; the potassium has so inordinate a desire for oxygen, on the principle of affinities or attraction, that the moment they come in contact, the oxygen is abstracted, and hydrogen—an inflammable gas—is set on fire.

Again, if we take a platina ladle and hold it over a furnace until it becomes of a bright red heat, and then project a jet of cold water into its bowl, we shall find that the water will remain quiescent, and give no sign of ebullition—not so much as a single "fizz;" but the moment the ladle begins to cool, the water will boil up and rapidly evaporate.

So, also, if a mass of metal, heated to whiteness, be plunged into a vessel of cold water, the surrounding fluid will remain comparatively tranquil as long as the glowing white heat endures; but the moment there is a sufficient fall in the temperature of the metal the water will boil briskly.

If water be poured upon an iron sieve, the wires of which are red hot, it will not run through; but on the sieve cooling, it will run through rapidly.

The above contradictory effects are easily accounted for. The repelling power of intense heat keeps the water from immediate contact with the heated metal, and the particles of water collectively retain their globular form; but when the metal vessel cools, the repulsive power diminishes, and the water coming into closer contact with the heated surface, its particles can no longer retain their globular form, and eventually expand into a state of vapor. This globular condition of the particles of water will account for many very important phenomena; perhaps it is best exhibited in the dew-drop; and so long as these globules retain their form, water will retain its fluid properties. An agglomeration of these globules will carry with them, under certain circumstances, so much force that it is hardly a contradiction to call water itself a *solid.*

The chemical action of certain poisons (the most powerful of all agents) upon the human frame has plunged the Faculty into a maze of paradoxes; indeed, there is actually a system of medicine (advancing in reputation) which is founded on the *curious* principle. A famous Saxon was the founder of it; and, curious enough, medical men (who are notorious for entertaining contrary notions, for "doctors will differ,") are still speculating among themselves whether he was a very great quack or a very great philosopher. It is not our purpose to attempt to decide this apparently complex question; but we can garner up from his experience some curious contradictions, which help us still further into the mysteries of chemical science. While engaged in translating an article upon "Bark," from Cullen's famous *Materia Medica*, he experimentally tasted some of this medicine, which had long been celebrated as a cure for the ague, and not long afterwards he began to experience agueish symptoms! This led him to the inference that medicines which give rise to the symptoms of a disease are those which will specifically cure it; and, curious as it may seem, several subsequent experiments have confirmed this theory. Jenner's discovery of vaccination for the small-pox—the method usually adopted in the treatment of frost-bitten limbs—the administration of stimulants and opiates to persons whose constitutions have become enervated, whose limbs totter, and whose minds have sunk into a state of low muttering delirium or raving madness from the effects of strong drink, are only a few of the examples which might be eliminated to show up the paradoxes that everywhere crowd upon us.

Thus we live in a world of apparent contradictions and curiosities; they abound in every department of science, and beset us even in the sanctuary of domestic life. The discoveries of science have explained and reconciled some of them; but many still baffle our most strenuous mental exertions, and remain involved in mystery.

The Commissioner of Patents and the Patent Office.

We understand that the President has decided upon a suitable person to fill the office of Commissioner of Patents; but up to the time of our going to press, the name of the appointee had not been made public. The office was tendered to Joseph Holt, Esq., of Kentucky, but he promptly declined it. Probably he was not tempted by the miserable salary of $3,000 to give up a practice worth double that sum. The Middletown (Conn.) *Sentinel* intimates that the Hon. John C. Palmer, of Hartford, is most likely to be the appointee, and goes on to say that he would ably fill the office. This opinion is confirmed to us by parties in this city who are acquainted with Mr. Palmer. It is our impression, however, that he will not receive the appointment. At any rate, let us have a good man for the place, and we care not from whence he comes.

We announced last week that Mr. Rhodes, of Louisiana, had succeeded Dr. Breed as Examiner in the Chemical Department. It appears, now, that this was an error. Mr. Galpin, it seems, fills this place; and Dr. Thomas Antisell, of this city, succeeds the late Mr. Tyssouski in the same department. These Examiners are men of quality, and will no doubt do all they can to render their services acceptable to all.

We are not the advocates of hasty changes in the Patent Office; but we have long been convinced that the departments most in need of official substitutes have been least subject to mutations in management; and if it would not be considered impertinent, we should like to inquire whether there have been, or are likely to be, any changes in Classes X, XII and XIII, comprising Land Conveyance, Civil Engineering, Mills and Presses? Also, whether the Chief Examiner of those classes evinces an amount of liberality equal to that which persons doing business with those departments have a right to expect, and which they most generally receive, to a greater or less extent, from other official heads? While denying all desire to unnecessarily cast the shadow of a doubt over the *educational* competency of the gentleman having charge of the above classes, a disinterested zeal to promote and protect the best interests of inventors prompts us to ask, is he perfectly *adapted*, in every sense of the word, to perform the important and responsible duties of the situation which he at present fills?

We make these inquiries at the suggestion of many inventors who, in confirmation of a long-existing impression of our own, have intimated to us, from time to time, that it is often pretty hard work to get even some deserving case successfully through the doors of the divisions above alluded to. If there is a screw loose here, it needs to be looked after; and whoever succeeds to the vacant chair of Judge Mason will do a service to the inventive community and the public generally, by inquiring into this matter. Examiners in the Patent Office are public servants, and they are bound to show a liberal discrimination in their official acts. No man deficient in this spirit of liberality is qualified to fill a public station of this character, and none such should enjoy it. We invite the attention of the Secretary of the Interior to the consideration of this subject.

A Profitable Enterprise.

Many of our readers have made large sums of money in various ways by small investments; some by patenting a novel invention, and others, less ingenious, by purchasing rights and re-selling the same. We have a suggestion to make in regard to money-making, by which, aside from any personal interest, (which we admit is considerable,) we believe any person who will properly exert himself can make a very handsome sum, and one which need in no way interfere with his regular business. We have evidence that some of our friends have taken our previous hint, and are laboring to earn some of the liberal prizes which we offer to those sending us clubs of subscribers this fall; and it is such men as these who will be able next January to endorse our assertion, that sometimes a little industry is very liberally rewarded.

This is the first number of a new volume, and we trust many of our patrons and friends will show it to their neighbors and acquaintances, and ask them to subscribe even if they have no wish to get up a club and compete for a prize. It will be commendable in those who thus exert themselves to extend the circulation of the SCIENTIFIC AMERICAN; and we are sure that all who are induced to do so will, at the end of the volume, thank the person who solicited them to make the investment. But we would call special attention to the reward which is in store for such as make an effort to get large lists of subscribers. Just turn to the Prospectus on the last page of this paper, and then see what an inducement is offered for the *fifteen* largest lists of mail subscribers that may be sent to our office before the 1st of January next.

Reader, seize this opportunity to make a few hundred dollars; it is easily done. Send to our office for a Prospectus, and go to work.

Our New Dress.

The beautiful fonts of type upon which this number of the SCIENTIFIC AMERICAN is printed, are from the type foundry of Robert Lindsay, No. 128 Fulton street. It speaks for itself. The various mechanical engravings and devices which embellish this week's issue were designed by Forbes & Bond, and engraved by Richard Ten Eyck. The work of these excellent artists scarcely needs our commendation, as the columns of this journal for some years past give convincing proof in their favor.

The London *Christian Spectator* says:—"As a general rule, we believe American theological writers to be better versed in modern languages and more deeply read in ancient literature—in other words, better and abler scholars—than the majority of theological writers in this country."

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Feats of Fire-arms.

The Crimean war and the recent revolt in the East Indies have given an impetus, in a martial direction, to the inventive talent of a great number of ingenious men, both in the United States and Europe; and this movement in military manufactures has resulted in the issue of many patents (especially in this country) for improvements in fire-arms, the majority being of a breech-loading character.

On the 17th ult. a Board of experienced military officers was convened at West Point, N. Y., for the purpose of testing the respective advantages of various new breech-loading rifles, with a view to ascertain which arm of that description is best suited to the service of the United States army. Through the courtesy of an ingenious and gallant friend, an officer in the Ordnance Department, we have been favored with the following interesting account of the experiments made before the Board:—

MESSRS. EDITORS:—In compliance with your polite request that I should report the results of the breech-loading trials now going on at West Point, N. Y., the following succinct statement is submitted for the information of the readers of your valuable journal:—

About three years ago, Congress, desirous of fostering the growth of the manufacture of arms in this country, or from some other motive, made an appropriation of something less than a hundred thousand dollars for the purchase of the *best* breech-loading arm that the country produced. This was originally intended for the benefit of a particular company, but an amendment—viz., the word "best"—threw it open to all arms, and in such manner as the Secretary of War might see fit. Thus was given a strong incentive to mechanical ingenuity. Now, our people, as you know, have more of that quality, *pro rata*, than any other; and I heard an officer, who was stationed at the arsenal at Washington in the years 1854–'55, say that, on an average, there came down there at that time, to be tried and reported upon by the directions of the Colonel of Ordnance, two new breech-loaders per week. Secretary Davis had preliminary trials before a Board of officers convened for that purpose, in order to select the best of those presented, and submit them to further trial in the hands of the troops. Only four competitors were admitted, viz.: Sharpe's Co., Perry, Green, and Symmes. Others were admitted afterwards, who had not submitted their arms to the Board, making in all some eight or ten. Each of these had an order for a limited number, and they went to the field.

Before the experimenting officers had reported on the merits of the arms, the Administration changed, and with a new Secretary of War came in new ideas. The present Secretary brought officers from the field, and told them to arraign and try all the breech-loading world.

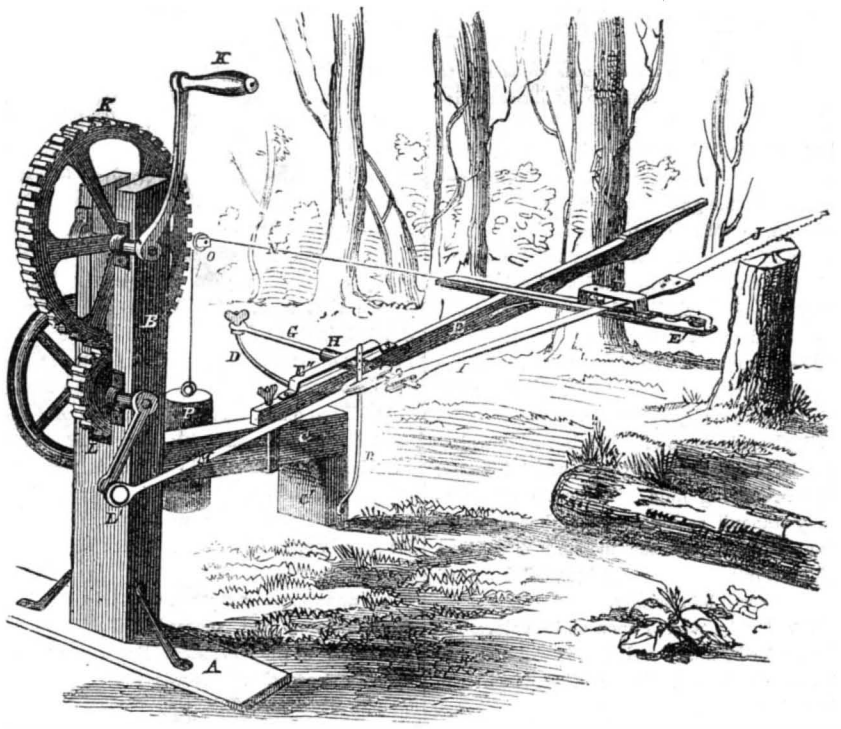
The officers comprising the Board will be recognized by any one familiar with their register as being "from the field." They are as follows:—Lieut. Col. Beale, Major H. Hill, Capt. Thos. Duncan, Capt. Heth, Capt. Benton, and Lieut. Gibbon. This Board assembled at West Point on the 17th ult., as per orders, but did not get to work before the 19th. The place chosen for the firing is across a bend or inlet in the Hudson river. A platform is erected and covered with canvas, from which the guns are to be fired. The rifles are not fired off-hand, but by a person sitting on a stool, resting the barrel of the piece on a support, and also bending forward and resting his right arm against a bench, from which the support of the barrel is raised. Each gentleman exhibiting a gun must submit it to the following test, viz.: 20 rounds at a target at 100 yards, 20 rounds at 300 yards, 20 rounds at 600 yards, 18 rounds to judge of rapidity, and 100 rounds to judge of durability. This is a severe test, but a good one. The members of the Board do not scruple to take hold of the guns and carry on the firing themselves, first having taken the precaution of letting each inventor expose himself to any dangers from the same, for five or six rounds. Thus they proceed, slowly, but quite surely. Twenty-three guns are said to have been presented. Some competitors have declined or "flunked," but a majority have stood up to the test. These, in order of time, are as follows:—

1. Howe.
2. Gross.
3. Schenkl.
4. Gibbs.
5. Morse.
6. Merrill.
7. Burnsides.
8. Green.
9. Sharpe's Co:
10. Colt.
11. Jocelyn.

Of these arms, Mr. Howe's was an exceedingly simple chamber gun, but did not shoot accurately, as almost every chamber gun fails in this respect. I now distinguish between chamber-loading, where the cartridge is inserted backwards, or the powder first, and breech-loading, where it is inserted forward, or the ball first. Mr. Gross' arm is a chamber gun, also, but I $\frac{5}{8}$ was not present when it was fired. Mr. Schenkl's weapon is a modification of the Prussian needle gun, with the cap in the base of the ball. I understood that it did not fire well. Mr. Gibbs' arm (a breech-loader) has the barrel movable, and closes down and back against the breech. It did good shooting. Mr. Morse's gun was a breech-loader; he used a brass case and beautifully swedged ball for his cartridge, and the cap or explodent was fastened in the bottom of the metal cartridge, so that a smart blow from behind, made by the hammer, was the cause of the explosion. The case was automatically withdrawn, when it was necessary to insert another cartridge. His shooting was moderately accurate. Mr. Merrill's weapon was a faucet breech-loader. He used, I think, too little powder, and his ball did not weigh enough. He, also, did only moderately well. General Burnsides presented a beautiful chamber gun. His cartridges, also, were encased in thin brass covers. They were made to fit both the chamber and barrel by a zone of lead on the end of the brass next the ball. This gun did good firing. It was subjected to a wetting while loaded; after which it was not used for two days; it was then fired perfectly free. The cartridges, also, were submerged for a day, and then fired. This gun presents strong claims upon "the service." Next came the breech-loader of Col. Green, (not Greene,) of Boston. He has named his weapon "the plug-ugly." It has the peculiarity of loading forward—the powder first and then the ball, and lastly a thick felt wad. Thus the ball of the preceding cartridge is propelled by the cartridge that is fired. The lock is underneath, and the cap fires through the side of the cartridge. It is a good rough little piece, but did not throw its ball with great accuracy. Then came the piece so well known as Sharpe's. It had the gas-choke in it, and was fired, by the aid of the primer arrangement, *eighteen shots in fifty-five seconds*—an unprecedented rapidity; not but that any breech-loader could do the same with proper arrangement for primers. Let Americans think of this: Are soldiers brought before an enemy for the purpose of *receiving* or of *giving* balls? All we want is what the Board are now seeking. This gun, however, was not "up" in accuracy, having been beaten by Gibbs' and equaled by Burnsides'. Then came Col. Colt's piece. This gun is well known. It is a "five-shooter," strong, and well made. It fired the heaviest ball (530 grs.), and was the most accurate of all the guns thus far tried—beating Gibbs', Sharpe's and Burnsides' by far. How much is to be deducted for extra length of barrel (35 inches) and overweight (12$\frac{1}{2}$ lbs.), the Board are to judge. Its rapidity of firing was not so great as was expected. The next was the Jocelyn gun. It is a breech-loader, of very neat appearance, but the connection between the cap and the chamber is such as not always to communicate fire to the cartridge. It shot unaccountably wild, probably because the ball stripped.

Next week I will give the remaining trials, two of which promise to be very interesting. †

LUDWIG'S MACHINE FOR FELLING TREES.



The labor required in felling trees by the ax, in the ordinary manner, is considerably greater than would be required in severing the trunk, under favorable circumstances, by an ordinary cross-cut saw; but the unfavorable position of the work for operating a saw, goes far to counterbalance this advantage, and to compel an adhesion to the old system of chopping. It is evident that the absolute amount of power required to excavate a thin kerf by a saw is far less than that to remove two large wedge-shaped sections, as is required in felling by the ax; the problem is to so mount the saw that it may be moved with facility, and that it may be operated by a motion which is easy for the muscles.

The engraving here presented shows a light and simple apparatus, invented by Matthew Ludwig, of Boston, a gentleman of considerable experience in adapting saws to this and analogous uses. The power of the man or men is applied to a crank or cranks on a suitable frame, and the saw is made capable of being worked thereby with a rapid motion, either in making a horizontal cut, such as is required for cutting off a standing tree, or in vertical cuts, such as are adapted to cut up the log into suitable lengths after it has been felled.

A is a broad foot, and B a stout upright. The latter is divided into two parts at the top, as represented, and forms the bearings for the shafts. C is a horizontal part or stick, mortised into B, and C′ is a leg or support therefor. D is a light iron rod projecting nearly in a horizontal direction at right angles to C, and E is a long wooden arm, connected by one or more bolts to C, as represented. E′ is a cross bar, extending rigidly across E near its center, and E″ is a light iron attachment on the top of E, to guide the roller, H, which latter will be described below. F is a carriage, so connected to the cross bar, E′, that it is free to slide endwise thereon. G is a light rod, termed a radius bar, jointed at one extremity to the fixed rod, D, and at the other to the rod, I, which latter, passing through the carriage, F, is firmly fixed to the saw, J. The office of G is to guide the motion of I. It plays backwards and forwards as the saw is moved, and is provided with the roller, H, to diminish the friction against E and E′, which would otherwise be caused by its motion.

K is a crank, and K′ a stout gear, which is turned thereby. L is a smaller gear wheel, the motion of which is steadied by a balance wheel, as represented, and which turns with some 2$\frac{1}{2}$ or 3 times the regular velocity of K′. L′ is a crank on the same shaft, which gives, by means of the connecting rod M, a reciprocating motion to the radius bar G, and thus to the nearest extremity of the saw bar I. This motion is not rectilinear, but curved, according to the length of the radius bar G, and this imparts a slight oscillating motion to the saw, which aids in clearing the sawdust.

This makes one of the simplest methods of mounting a saw for this purpose, and one which involves less friction than any other with which we are acquainted. The saw is urged up to its work by the tension of the cord N, to which is suspended a weight P. This cord is not attached directly to the saw bar I, but to the carriage F, and there is a roller, as represented in F, to diminish the friction which would otherwise be experienced at that point.

This machine is adapted, by a very simple change, to the cutting off of logs. For this purpose it is necessary simply to bolt the long bar E on the side, instead of the top, of C, and to disconnect from the radius bar G, and make the connections to the bar P, which serves in its stead for vertical cutting. In such cutting the cord N and weight P are dispensed with, and the weight of the parts are amply sufficient to hold the saw teeth to the work.

This machine is an improvement on the machine formerly patented by Mr. L. for the same purpose. It was patented on the 30th of June last. For further particulars address M. Ludwig, 35 London street, Boston.

Steam Cultivation in England.

An experiment has recently been made in Lincolnshire, Eng., in steam plowing, with Boydell's traction engine, which appears, from the published reports, to have given satisfaction. Several varieties of plows were tried, the peculiar construction of which we cannot get at from the vague descriptions given of them; but it was proved that the traction engine, with three double plows, plowed one acre in seventy-three minutes, or about eight acres in one day of ten hours, at a cost, in labor and coals, of about $7 50, while the work performed by six single plows, with eighteen horses, in the same time, would be only four acres and a half, and this at a cost of about $12 50—being three acres and a half in quantity, and a little less than $5 in favor of the steam work. The prime cost of the engine with the plows complete, is estimated to be about the same as eighteen horses, while upon the point of wear and tear, the former would be the most economical.

A Trap Vender and his Wares.

I. S. Clough, whose advertisement appears in another column, is quite as much of a novelty in his way as the thousand and one traps which he is constantly offering for sale, and it would do some of our country friends good to call upon him when in the city, and look over his effects. He has letters from the most eminent men of the day; notices from all sorts of newspapers, for which he has a strong predeliction; besides cockroach traps, rat traps, mice traps, fly traps, match safes, tooth-picks, furniture and stove polish, apple parers, apple and potato slicers, &c.,

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Correspondents

E. G., of Va.—The idea of employing electric currents in the process of bleaching materials for paper-making, would not, in our opinion, be of any practical value; besides, the suggestion is not new.

A. E. R., of S. C.—You inquire "how it happens that so many inventors are constantly engaged in trying to invent an improved churn, washing machine, or pump?" The reason is perfectly obvious, and originates as much from one of the laws of trade as the manufacture of cotton cloth. Almost every family in our land has a direct interest in these m chines—therefore inventive genius is more or less active in devising better plans and devices to meet the general demand. Every family does not want a carding machine or a smelting furnace, and hence it is that less general attention is paid to them.

J. L., of Wis.—We thank you for informing us that a rumor has been started in your vicinity to our prejudice as honorable Patent Agents. It has doubtless been put in motion by some irresponsible and unprincipled fellow who has not the capacity to lay a foundation for himself. We have outlived such rumors by our professional acts, and seldom, if ever, deign to take notice of them. We are perfectly able to continue our business in defiance of such malicious reports.

S. S., of Ind.—" Suppose a person has a patent for a wagon, one of the claims being on the bed, another on a particular style of wheel, can the patentee sell rights for the wheel alone, without selling the right to the whole patent—that is, selling one or more claims of a patent without the others ?" We answer that a patent cannot be obtained to cover under one issue two distinct features as set forth above. A patentee may set a limit upon the particular use of his invention, or such separate portions of it as he may have covered in his claims.

S. R., of Ark.—It is said that if small pieces of cyanuret of potash of the size of a pea are put into the holes of ants. it will, by repeated application, entirely exterminate them.

T. T., of N. Y.—It is considered unsafe to enter a sick room in a state of perspiration, as the moment you become cool your pores will be likely to absorb. Do not approach contagious diseases with an empty stomach, nor sit between the sick and the fire, as the heat attracts the vapor.

U. A. B., of N. Y.—We consider Haswell's Pocket Companion the nearest to "a work in a compact form for practical work" of any in print. The price is $1 25. It is published by the Harpers, this city.

S. H. R., of Del.—Your idea of driving a water wheel by the water raised by a pump driven by the wheel itself, is one that has suggested itself to many persons unacquainted with mechanical principles. If there was no such thing as friction, and the full effect due to a certain fall of a given quantity of water could be obtained practically, your apparatus when started as you propose would continue in operation, but even then you must have a fall for the whole quantity of water equal to the hight the water is to be raised. The thing is entirely impracticable; it is, in fact, perpetual motion.

Marcus Pratt, of North Adams, Mass., wishes to correspond with the owner of Edgcomb's Patent Washing Machine for the county of Litchfield, Conn.

C. C. H., of Mich —The Hughes telegraph does not both send and receive signals at the same instant of time; but during the intervals in the touch of the signal keys at one end of the line, signs may be returnod in a contrary direction from the opposite end.

L. H., of Ohio.—You had better address T. & J. N. Aldrich, of Hudson City, N. Y., if you wish to carry out the principle of smoke burning to the very highest perfection. We believe in making the tops of low chimneys a trifle larger than the base inside, but in high stacks the stability of the construction overrules the arguments in favor of such form.

C. M. Lee, of Sioux City, Iowa—Wishes to purchase either a new or a second-hand lathe, 3½ or 4 feet long, and 6 or 8 inches swing, with slide rest, and arranged for cutting screws. He is a gunsmith.

C. W. G., of Ill.—There is no description of your harvester in the paper sent, from which we can get at a clear idea of its construction. We prefer in all cases, when we notice an improvement, to accompany it with an illustration.

L. B. C., of S. C.—You can procure improved machinery for making crackers from Wm. R. Evans, 87 Eldridge street, this city.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, September 5, 1857 :—

W. H., of N. Y., $25; E. P. S., of N. Y., $20; G. W. R., of Iowa, $30; A. J. C., of Ind., $12; F. W., of Tex., $30; C. E. S., of Mass., $30; W. D., of N. Y., $25; M. T., of Ill., $27; S. E. D., of Conn., $30; F. T., of N. Y., $15; C. T., of N. Y., $30; M. & B., of ——, $25; Z. W., of N. J., $30; L. & B., of N. Y., $30; R. H. L., of Pa., $25; J. P. B., of Conn., $30; A. C. A., of Conn., $15; L. A. B., of N. Y., $55; J. G., of Ga., $30; C. O. L., of Vt., $30; A. G., of Mass., $25; A. E. B., of Mass., $25; C. H. A., of N. Y., $29; W. W. D., of Cal., $150; G. & P., of Mich., $30; J. W. R., of N. J., $30; D. B. K., of Tex., $40; T. E. L., of Wis., $25; H. T. G., of Mass., $25; R. W. S., of N. Y., $25; W. S. W., of L. I., $30; W. K. S., of La., $30; J. McA., of N. Y., $15; J. F. & E. W., of N. Y., $30; E. G. C., of Pa., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Sept. 5, 1857:—

W. D., of N. Y.; J. H. F., of Cala; G. T. J., of Ga.; W. H., of N. Y.; St. J. & B., of N. Y.; H. T. G., of Mass.; W. & F., of Paris; J. F. & E. W., of N. Y.; N E. B., of Mass.; C. H. A., of N. Y.; A. G., of Mass.; S. P. C., of N. Y.; T. E. L., of Wis.; E. G. C., of Pa.; A. C. A., of Ct.; A. J. C., of Ind.; Z. W., of N. J.; R. H L., of Pa.; J. P., of Mich.; J. G., of Miss.

Literary Notices.

THE ECLECTIC MAGAZINE OF FOREIGN LITERATURE, for September, is received, with the usual freight of highly interesting and valuable selections. The contents include a history of the Christian Sabbath; a sketch from Loomis' "Progress of Astronomy," re-selected from the *Westminster Review*; an excellent article entitled "The Puzzles of Geology;" Irish Orators; King Sword and King Pen, and various short articles. 144 pages monthly.

EMERSON'S UNITED STATES MAGAZINE, for September, is a good number. It contains an illustrated Life of Washington. The publishers of *Putnam's Magazine*, having suspended, that serial will in future become merged in the *United States Magazine*. Terms per annum, $3. J. M. Emerson & Co., publishers, 371 Broadway.

TERMS OF ADVERTISING.

Twenty-five cents per line each insertion. We respectfully request that our patrons will make their advertisements as short as possible. Engravings cannot be admitted into the advertising columns.

*** All advertisements must be paid for before inserting.

IMPORTANT TO INVENTORS.

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THE TENTH ANNUAL EXHIBITION OF the Maryland Institute, Baltimore, will be opened on the 29th of September, and continue to the 29th of October, 1857. Goods for competition and premiums will be received from the 22d to the 24th of Sept., inclusive, afterwards for exhibition only. Mechanics, manufacturers, inventors, artists and others, of the entire country, are respectfully solicited to contribute to the same, and assured that every effort will be made to display their works to the best advantage. Circulars containing rules, regulations, &c., will be promptly furnished by application to JOHN S. SELBY, Actuary.
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TO INVENTORS AND MANUFACTURERS.—Rooms with power, for the exhibition of machinery, can be had in the Depot Buildings, corner of Elm and Franklin streets, New York. The location is extremely desirable for its prominence and convenience to the business part of the city. Apply to T. BENNETT, on the premises.

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Science and Art.

The Late Commissioner of Patents.

The readers of the SCIENTIFIC AMERICAN have been made so familiar, through our columns, with the name and official acts of the Honorable Charles Mason, late Commissioner of Patents, that we have thought they would be interested in knowing something of his personal appearance and history.

We accordingly present herewith an engraved portrait of the distinguished gentleman, together with a few facts concerning his public life and his administration as Commissioner. The likeness is an excellent one.

Judge Mason is a native of the State of New York, having been born in Onondaga county. During his early life he spent four years at the Military Academy at West Point, where he graduated in 1829, with considerable honor, receiving immediately afterwards an appointment as Professor in the same institution, which he held for about three years. After this he engaged in the study of the law, and for some time resided in the village of Newburg, N. Y., where he carried on the duties of his profession.

After this he removed to New York, and for a time took editorial charge of the *Evening Post*, during Mr. Bryant's absence. It is generally allowed that he discharged the duties of an editor with that same thoroughness, earnestness and excellence which has characterized his life in every situation in which he has been placed. Subsequent to this he removed to Iowa, and in 1838 was appointed Chief Justice of that Territory, which office he filled for nearly ten years, with great credit, and to the manifest advantage of the public good. It was in this manner that he obtained the title of Judge Mason. During the period of his employment as Commissioner of Patents, he was engaged as Law Commissioner to prepare a code of laws for Iowa, which has received the unqualified approbation of all who have examined its various requirements.

Judge Mason was appointed to the office of Commissioner of Patents in March, 1853, and held the post for a little more than four years.

The Patent Office was in a state of great confusion when Judge Mason assumed its administration. This was due, in part, to incongruity in its rules and regulations, and also to a want of numerical force in its employees. Applicants for patents were compelled to wait from six to twelve months before their cases received examination. One of the earliest acts of the new Commissioner was to double the examining corps, and to augment the help in other departments. New and efficient rules were adopted, and the workings of the entire business were made better to harmonize. Under the new *regime*, the previous confusion and delays wholly disappeared, and the Patent Office became distinguished for the promptness and regularity of its transactions.

Appeals, formerly heard by examiners, after long delays, were now listened to by the Commissioner in person, at a moment's notice. The ease with which he penetrated the mysteries of chemical inventions, or unraveled the complexities of difficult mechanical improvements, astonished every one. He was prompt and fearless in his decisions. He believed that the Patent laws were instituted for the benefit and encouragement of inventors, and he interpreted them accordingly. If he was uncertain as to the novelty of an invention, he gave the benefit of his doubt to the inventor, and ordered the patent to issue. The inventor, sensitive and smarting under the sting of some ill-judged decision of an examiner, found a soothing balm for all his woes when he came into the presence of Judge Mason. He was as a father to inventors. He never knowingly allowed an unjust rejection to stand. Much of his time was devoted to the repeal of decisions by illiberal examiners. He paid no attention to office hours. Many a midnight hour has found him industriously engaged in the examination of appeals, solicited, perhaps, by some humble, unpretending applicant. To him all applicants for patents were alike. If he manifested any partiality at all, it was in favor of the poor and helpless.

The number of applications for patents made during the year preceding Judge Mason's appointment was 2,639. The number of applications for the present year is estimated at 6,000. This remarkable increase may be attributed, to a great extent, to the wise government of the affairs of the department by the Commissioner.

The annual Patent Reports were formerly meagre, uninteresting volumes. Judge Mason caused them to be illustrated with diagrams of all the inventions patented during the year. His report to Congress for 1856 will consist of four handsome volumes. It was his desire to see all the patents, with their drawings, published in full by the government. But he did not remain long enough in office to carry out this gigantic enterprise.

The following extract from a cotemporary gives a correct idea of Judge Mason's personal appearance:—

"In person, Judge Mason is tall and erect, with strong, thick, brown hair, a countenance highly expressive of rapid and energetic

HON. CHARLES MASON.

thought, cheerfulness, benevolence and lofty feelings; his frame indicates considerable power of physical endurance; his carriage is easy and graceful, and his whole appearance at once prepossessing and calculated to inspire feelings of respect. In his conversation he is frank, plain, concise and methodical, seeming always to be self-possessed, and seldom hesitating in a reply. His perceptions are remarkably quick, and, like Mr. Calhoun, he seems to come to conclusions almost instinctively. All accord to him great powers of perception, quick, close and powerful reasoning faculties, and all that suavity and genuine good breeding which usually mark the accomplished soldier and scholar. In short, no one can be in company with Judge Mason, even for a few minutes, without being fully satisfied that he is a man of exalted mind and character."

The father of Mr. Mason was an honest, hard-working man, and his more honored son followed the same laborious occupation from the early age of twelve to his seventeenth year. Judge Mason is emphatically a self-made man.

The Inventor of the Safety Lamp.

Dr. Smiles, of England, has recently published a very interesting life of George Stephenson, the eminent English engineer. Inch by inch he worked his way upward, from his position as foreman to the pumping engine at Wylam Colliery to that of the "father" of the universal and magnificent system of railroads. It is said of him that one of the chief pleasures of his latter days was to hold out a helping hand to poor inventors who deserved assistance. In 1812, while engaged as an "engine-wright" at Kellingworth, he made an invention which would probably at once have made his merits known over Britain, but for his having a competitor in the field in a man already distinguished as Sir Humphrey Davy. This was that of the "Geordy" safety lamp—a lamp identical with the "Davy" in principle, though different in practical detail. A very interesting account of the tentative process by which Stephenson arrived at his safety lamp, as also of the controversy relative to priority of invention which ensued between Stephenson's friends and the friends of Sir Humphrey, is given in the work referred to. Suffice it to say, that, though at the time the fame of "Geordy" was eclipsed by that of the "Davy," and the unknown engine-wright of Killingworth had no chance with the public against the brilliant poet-philosopher of the metropolis, and was even denounced most unhandsomely by Sir Humphrey and his friends as an impostor, the evidence adduced by Dr. Smiles proves not only that the "Geordy" was a better practical safety lamp than the "Davy," but also that it was independently constructed and tried by its inventor (October 21, 1815,) before anything was publicly known of Sir Humphrey's experiments. Stephenson felt the injustice done him by the accusation of fraud in the matter of his "Geordy," but he behaved manfully and modestly in the affair; did not refuse the 100 guineas which the coal owners of the North had voted him, when they voted 2,000 guineas to his rival, but waited his time when another invention, which was then occupying him, should give him an undisputed title to larger rewards and a wider celebrity. This was the invention of the railway locomotive, or, as Stephenson in his simpler style called it, the "traveling engine."

Death of an Eminent Physician.

Marshall Hall, F. R. S., the well-known English physician, died at Brighton on the 11th of August. The deceased was one of the most eminent members of the medical profession, widely known as a lecturer, author and gentleman of high scientific attainments. He visited this country, accompanied by his son, in 1853-4, and was received with much consideration in all parts of the Union.

NEW Prospectus

OF THE

SCIENTIFIC AMERICAN.

VOLUME THIRTEEN.

TO MECHANICS, MANUFACTURERS, INVENTORS AND FARMERS.

In announcing the THIRTEENTH Annual Volume of the SCIENTIFIC AMERICAN, which commenced on the 12th of September, the Editors and Publishers embrace this opportunity to thank their numerous friends and subscribers for the encouraging and very liberal support heretofore extended to their journal, and they would again re-assure its patrons of their determination to render the SCIENTIFIC AMERICAN more and more useful, and more and more worthy of their continued confidence and good will. The undersigned point to the past as a guarantee of their disposition to always deal justly and discriminatingly with all subjects of a Scientific and Mechanical character which come within their purview.

Having entirely discarded the system of employing itinerant agents to obtain subscribers, the Publishers of the SCIENTIFIC AMERICAN propose to offer

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For all clubs of Twenty and over, the yearly subscription is only $1 40.

The general character of the SCIENTIFIC AMERICAN is well known, and, as heretofore, it will be chiefly devoted to the promulgation of information relating to the various MECHANICAL AND CHEMICAL ARTS, MANUFACTURES, AGRICULTURE, PATENTS, INVENTIONS, ENGINEERING, MILL WORK, and all interests which the light of PRACTICAL SCIENCE is calculated to advance. It is issued weekly, in form for binding; it contains annually from 500 to 600 finely executed Engravings, and Notices of American and European Improvements, together with an Official List of American Patent Claims, published weekly, in advance of all other papers.

It is the aim of the Editors of the SCIENTIFIC AMERICAN to present all subjects discussed in its columns in a practical and popular form. They will also endeavor to maintain a candid fearlessness in combating and exposing false theories and practices in Scientific and Mechanical matters, and thus preserve the character of the SCIENTIFIC AMERICAN as a reliable encyclopædia of useful and entertaining knowledge.

☞ Specimen copies will be sent gratis to any part of the country.

MUNN & CO., Publishers and Patent Agents,
No. 128 Fulton street, New York.

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